

May 2017 TZ1

paper 1

Q19

an electron is accelerated through 2.5 MV what is the change in kinetic energy?

Volt = J/C energy/unit charge

Energy = $V \times q$

$= 2.5 \times 10^6 \text{ V} \times 1.602 \times 10^{-19} \text{ C}$

$2.5 \times 1.602 = 4.005 \times 10^{-13} \text{ J}$

10^{-12} is pJ answer is 0.4pJ

$2.5 \text{ MV} \times e = 2.5 \text{ MeV}$

Binding energy = mass defect \times 931 MeV/u

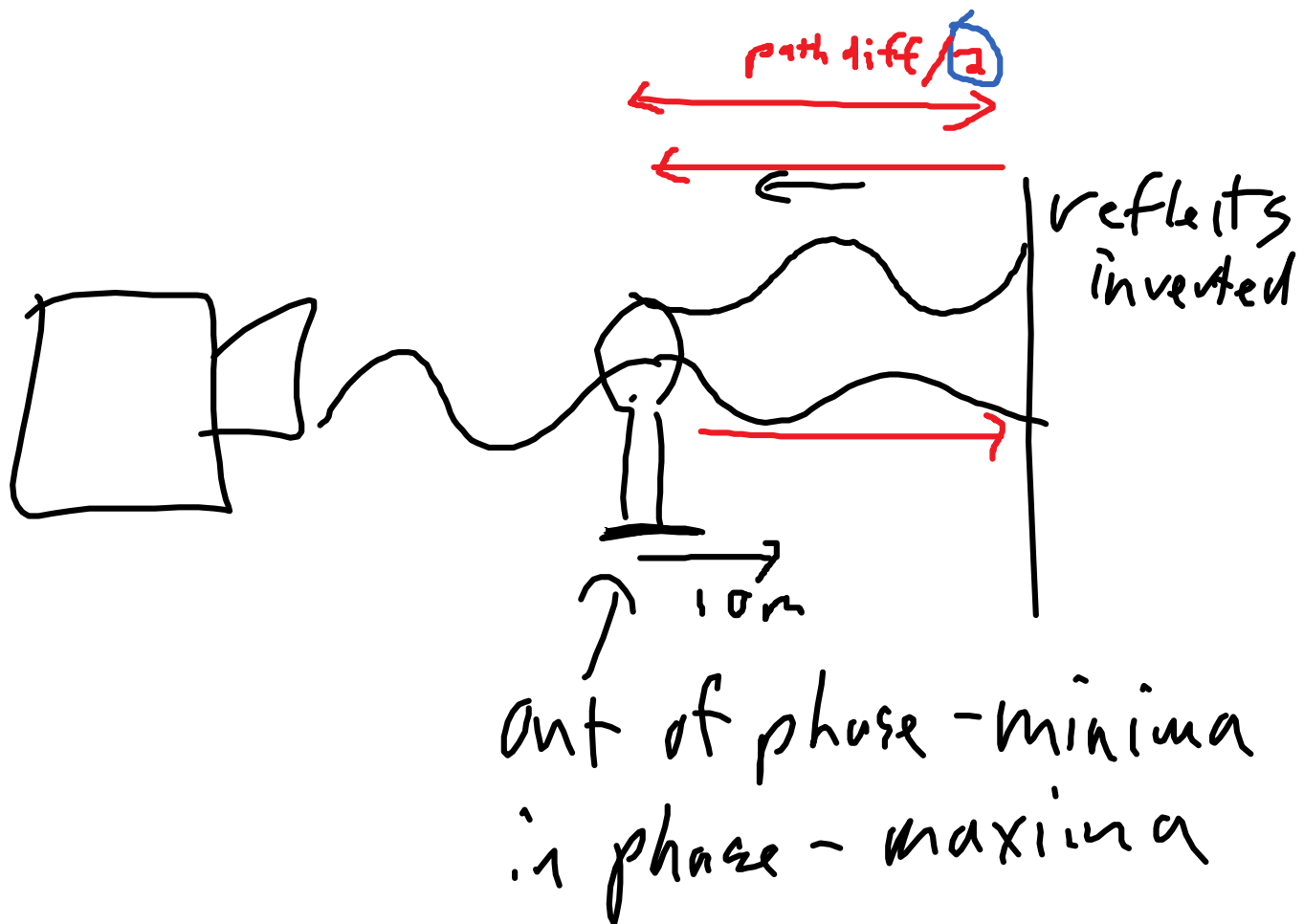
Q26 X absorbs n and to undergo fission and produce Y and Z

$X + n \rightarrow Y + Z + 2n$

Magnitude of
binding energy per nucleon Y > 1
 binding energy per nucleon X

for exothermic (heat out)

total binding of Y and Z > 1
 total binding of X



$N\lambda = d\sin\theta$ double slit or diffraction
 grating equation or $s = \lambda D/d$

constructive interference

path difference = $n\lambda$

destructive interference path

difference = $(n = 1/2)\lambda$

because the wave gets inverted at the reflecting surface if the path difference is a whole number of waves you get destructive interference

when you move the microphone

1.0m you get 7 maxima ($n=7$)

path difference = 2.0 m =

7(wavelength)

wavelength = $2/7=0.2857$ m

if you know the frequency

$v=\lambda f$

use the wavelength determined in b and the known frequency to calculate the speed of sound

labs that could be used for paper 3

data analysis:

<https://www.thinkib.net/physics/page/16576/required-practicals>

<https://sites.google.com/site/ibdpphysics101/prescribed-practical-work>